INVESTIGATOR'S ANNUAL REPORT

National Park Service

All or some of the information provided may be available to the public

Reporting Year: 1998	**Park:** Shenandoah NP
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No co-investigators

Permit#:
SHEN1998N150

Park-assigned Study Id. #:
unknown

Project Title:
Bird Monitoring: Monitoring Avian Productivity And Survivorship (Maps) In Shenandoah National Park (N-150)

Permit Start Date: Jan 01, 1998	**Permit Expiration Date** Jan 01, 1999
Study Start Date: Jan 01, 1992	**Study End Date** Jan 01, 2010

Study Status:
Completed

Activity Type:
Monitoring

Subject/Discipline:
Birds / Ornithology

Objectives:

The major objective is to monitor the primary demographic parameters of landbirds in Shenandoah National Park. Specific objectives are: (1) to establish and operate six MAPS stations in Shenandoah National Park for at least ten consecutive years that will provide: (a) annual indices of adult population size and post-fledging productivity of the breeding landbirds of the park from data on the numbers and proportions of young and adult birds captured; and (b) estimates of adult survivorship and recruitment into the adult population for these species from mark-recapture data on the adult birds captured; (2) to examine long-term trends in population size, productivity, and survivorship among Shenandoah's landbirds and attempt to infer proximate demographic causes for observed population changes; (3) to incorporate these data from Shenandoah into the continent-wide MAPS Program; and (4) to evaluate the usefulness of the MAPS Program as one component of Shenandoah National Park's and the National Park Service's long-term ecological monitoring efforts.

Findings and Status:

We completed the seventh year of the MAPS Program in Shenandoah National Park and the sixth consecutive year at the six MAPS stations as revised in 1993. Bird-banding was conducted at each station during one day in each of seven consecutive 10-day periods between May 31 and August 8. A total of 3914.5 net hours were accumulated at the six stations during the 1998 season. A total of 1353 captures of 37 species was recorded in 1998, greater than last year's total of 1251 captures. As in previous years, indices of total adult population size tended to be higher at higher-elevation stations dominated by red oak habitat and lower at lower-elevation stations dominated by chestnut oak habitat. ;Changes from 1997 in indices of adult population size were negative at five of the six stations as well as for all stations overall, but proved not to be significant; however, decreasing species outnumbered increasing species 23 to 13. Three species, Eastern Wood-Pewee, Carolina Wren, and Canada Warbler demonstrated significant declines from 1997; and no species showed a significant increase. In contrast to adult population size, the number of young birds captured increased substantially and significantly between 1997 and 1998. Both the number of young birds and productivity indices showed increases at five of the six stations as well as a near-significant ($P<0.10$) increase in the productivity index for the six stations overall. Three species, Downy Woodpecker, White-breasted Nuthatch, and Chestnut-sided Warbler showed significant or near-significant increases in productivity from 1997. No species showed significant decreases and increasing species outnumbered decreasing species 25 to four. Thus, the smaller and more experienced adult populations in 1998 showed a increase in productivity over those in 1997. Also, unlike the 1996 and 1997 seasons, weather during 1998 seemed mild and favorable for breeding success. ;Including data from the 1998 season allowed us to estimate adult survival rates for 14 of the 15 target species using a transient model

and including time dependence as a factor in these analyses. For Scarlet Tanager, there were too few between-year recaptures for mark-recapture methods to be able to provide realistic estimates of between-year survival even in a time-constant model. Time dependency in estimates produced by survivorship analyses was found in only one species, Hooded Warbler. With more years of data, temporal effects on survival probabilities will become more meaningful, although it is likely that at least ten years of data will be necessary to determine actual temporal trends in survivorship. Using temporally-constant transient models for the 14 species that provided realistic estimates, survival estimates averaged 0.511, ranging from a low of 0.276 for Indigo Bunting to 0.841 for Red-eyed Vireo.;We calculated five-year trends in adult population size for 15 target species. Significant or near-significant positive trends were detected for Wood Thrush, Red-eyed Vireo, and American Redstart, while Indigo Bunting and Dark-eyed Junco showed significant negative trends continuing from 1997. ;Results from the first seven years of the MAPS Program at Shenandoah National Park suggest that meaningful indices and estimates of primary demographic parameters can be obtained now for at least 15 target species and possibly more in the future; these will be useful for guiding management decisions in the Park. We conclude that the MAPS protocol is very well-suited to provide one component of Shenandoah's long-term ecological monitoring effort and recommend continuation of MAPS indefinitely into the future.

For this study, were one or more specimens collected and removed from the park but not destroyed during analyses?

No

Funding provided this reporting year by NPS:	**Funding provided this reporting year by other sources:**
19568	0

Fill out the following ONLY IF the National Park Service supported this project in this reporting year by providing money to a university or college

Full name of college or university:	**Annual funding provided by NPS to university or college this reporting year:**
n/a	0